Name: Date:

Polynomial Factoring solution (version 649)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 54 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(54)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 216}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-72}}{2}$$

$$x = \frac{12 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{12 \pm 6\sqrt{2}\, i}{2}$$

$$x = 6 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-5 - 7i$ and $-3 - 4i$ in standard form $(a + bi)$.**

Solution

$$(-5 - 7i) \cdot (-3 - 4i)$$

$$15 + 20i + 21i + 28i^2$$

$$15 + 20i + 21i - 28$$

$$15 - 28 + 20i + 21i$$

$$-13 + 41i$$

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3. **Write function $f(x) = x^3 - 3x^2 - 10x + 24$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-3	-10	24
4		4	4	-24
	1	1	-6	0

$$f(x) = (x-4)(x^2+x-6)$$

$$f(x) = (x-4)(x+3)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x+1)^2 \cdot (x-2) \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.